

**What is claimed is:**

1. A gamma camera, comprising:
  - a plurality of bar detector strips made of scintillating material, arranged in a stack configuration;
  - 5 at least one photodetector coupled to each end of said stack; and
  - a slat collimator including a plurality of elongated slats, for collimating each of said plurality of bar detector strips to receive gamma photons in only a single dimension.
- 10 2. A gamma camera as set forth in claim 1, further comprising a pair of photodetectors respectively coupled to each end of each bar detector strip of said stack.
- 15 3. A gamma camera as set forth in claim 2, wherein said pair of photodetectors are silicon strip detectors (SSDs).
4. A gamma camera as set forth in claim 2, wherein said pair of photodetectors are photodiodes.
- 20 5. A gamma camera as set forth in claim 1, wherein said bar detector strips are formed of CsI.
6. A gamma camera as set forth in claim 1, wherein said photodetector is a 25 position-sensitive photomultiplier tube (PS-PMT).
7. A gamma camera as set forth in claim 1, wherein each bar detector strip is located between individual slats of said slat collimator.
- 30 8. A gamma camera according to claim 7, wherein each of said individual slats has a length matching the length of said bar detector strips.

9. A gamma camera as set forth in claim 1, wherein said slat collimator is mounted adjacent to said stack.
10. A gamma camera according to claim 9, wherein each of said individual slats has a length matching the length of said bar detector strips in said stack, and wherein spacing between slats of said slat collimator matches dimensions of said bar detector strips.
11. A gamma camera, comprising:
  - 10 a plurality of bar detector strips made of scintillating material;
  - at least one photodetector coupled to each end of each of said bar detector strips; and
  - 15 a slat collimator including a plurality of elongated slats, for collimating each of said plurality of bar detector strips to receive gamma photons in only a single dimension.
12. A gamma camera as set forth in claim 11, wherein said photodetectors are silicon strip detectors (SSDs).
- 20 13. A gamma camera as set forth in claim 11, wherein said photodetectors are photodiodes.
14. A gamma camera as set forth in claim 11, wherein said bar detector strips are formed of CsI.
- 25 15. A gamma camera as set forth in claim 11, wherein each bar detector strip is located between individual slats of said slat collimator.
16. A gamma camera according to claim 15, wherein each of said individual slats has a length matching the length of said bar detector strips.

17. A gamma camera as set forth in claim 11, wherein said slat collimator is mounted adjacent to said plurality of bar detector strips.

18. A gamma camera according to claim 17, wherein each of said individual  
5 slats has a length matching the length of said bar detector strips, and wherein spacing between slats of said slat collimator matches dimensions of said bar detector strips.

19. A method of obtaining tomographic images of an object, comprising the  
10 steps of:

obtaining a plurality of sets of planar integral scintillation event data from said object at a plurality of azimuth angles of a rotating scintillation bar detector for each of a plurality of gantry angles of a gamma camera, said scintillation bar detector including

15 a plurality of bar detector strips made of scintillating material;  
at least one photodetector coupled to each end  
of each of said bar detector strips; and

20 a slat collimator including a plurality of elongated slats, for collimating each of said plurality of bar detector strips to receive gamma photons in only a single dimension; and

reconstructing said plurality of sets of planar integral scintillation event data to form a tomographic image of said object.

20. A method of obtaining tomographic images of an object, comprising the  
25 steps of:

obtaining a plurality of sets of planar integral scintillation event data from said object at a plurality of azimuth angles of a rotating scintillation detector for each of a plurality of gantry angles of a gamma camera; and

30 reconstructing said plurality of sets of planar integral scintillation event data to form a tomographic image of said object.